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CARNIVORES FROM THE JAMBER LOCAL FAUNA (PLIOCENE, VALENTINIAN), BOYD COUNTY, NEBRASKA

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Five types of carnivores have so far been recognized in the preliminary study of the Jamber Local Fauna (University of Nebraska State Museum Collecting Locality Boyd County no. 6), northern Nebraska. These include *Tomarctus* cf. *brevirostris*, *Aelurodon haydeni*, *Aelurodon* sp., *Leptocyon* cf. *vafer*, and *Pseudaelurus* cf. *marshi*. The Jamber Quarry carnivores and associated fauna appear to be Early Valentinian in age.

† † †

INTRODUCTION

Abbreviations used in the text are as follows: A.M.N.H. (American Museum of Natural History); F.S.G.S. (Florida State Geological Survey); U.N.S.M. (University of Nebraska State Museum); U.N.S.M. Coll. Loc. Bd-6 or Cr-12 (University of Nebraska State Museum Collecting Locality Boyd County no. 6 or Cherry County no. 12); U.S.N.M. (United States National Museum); and Y.P.M. (Yale-Peabody Museum). The specimens from the University of Nebraska State Museum Collections are the only ones studied first-hand.

An interesting and varied fauna has been recovered from the Jamber Quarry, Boyd County, northern Nebraska (U.N.S.M. Bd-6). One carnivore (Messenger and Messenger, 1976) and a rhinoceros (Tanner, 1976, and this volume) from this fauna have been published on to date. The rest of the carnivore specimens recovered from Jamber Quarry are described in this paper, with the remainder of the fauna and the stratigraphy to be published in the future.

Sediments in the quarry consist of cross-bedded, limonitic sands which contain lenses of green clay balls. The bones appear to be concentrated near the clay ball zones. Preliminary work on the biostratigraphic evidence from Jamber Quarry indicates a Lower Valentinian Provincial Age (Lower Pliocene) (Schultz and Stout, 1961; Schultz, Schultz, and Martin, 1970; Schultz, Martin, and Corner, 1975) for this fauna.

Individual variation has been taken into account in assigning specific identifications to the carnivores from the Jamber Local Fauna. For example, the *Aelurodon haydeni* jaw, U.N.S.M. 9401, is approximately one-third smaller than the published type. All the tooth measurements of this

specimen correspond with the type measurements in length-to-width ratio and fall within the range of observed variation of the *A. saevus* group of McGrew (1944) except for the P/3. This difference is attributed by the authors to individual variation within the *Aelurodon* group. Perhaps a comparison may be made to the degrees of variation documented in the modern-day wolf population. Young and Goldman (1944: 407) state:

"Irregular individual variation in relative size of the large cheek teeth are not infrequent." They further contend: "One or both of the small anterior premolars or posterior molars in either jaw may be absent, and in a few skulls supernumerary teeth were noted."

SYSTEMATICS

CLASS MAMMALIA ORDER CARNIVORA FAMILY CANIDAE

Tomarctus Cope 1873

Tomarctus cf. *brevirostris*, Cope, 1873

Holotype.—A lower jaw fragment A.M.N.H. 8302 from the Upper Miocene Pawnee Creek beds of northwestern Colorado (Matthew, 1924:88-96; Galbreath, 1953:34-35, 100).

Referred Specimens.—Anterior portion of a right ramus including /C-P/4: U.N.S.M. 9403 (Fig. 1, a-c). Posterior portion of a right ramus with M/1, M/2, and alveolus of M/3: U.N.S.M. 9404 (Fig. 1, d-f).

Discussion.—U.N.S.M. 9403 represents the anterior portion from the right ramus of a young adult. Its premolars show very little evidence of wear. The teeth are crowded but the tooth row remains straight, which White (1942:8) mentions as a characteristic of *Tomarctus brevirostris*. P/4 shows none of the backward tilt which is regarded as characteristic of *Aelurodon* (Matthew and Cook, 1909:373). Both the anterior and posterior borders of all the premolars are stepped. U.N.S.M. 9404 is the posterior portion, right

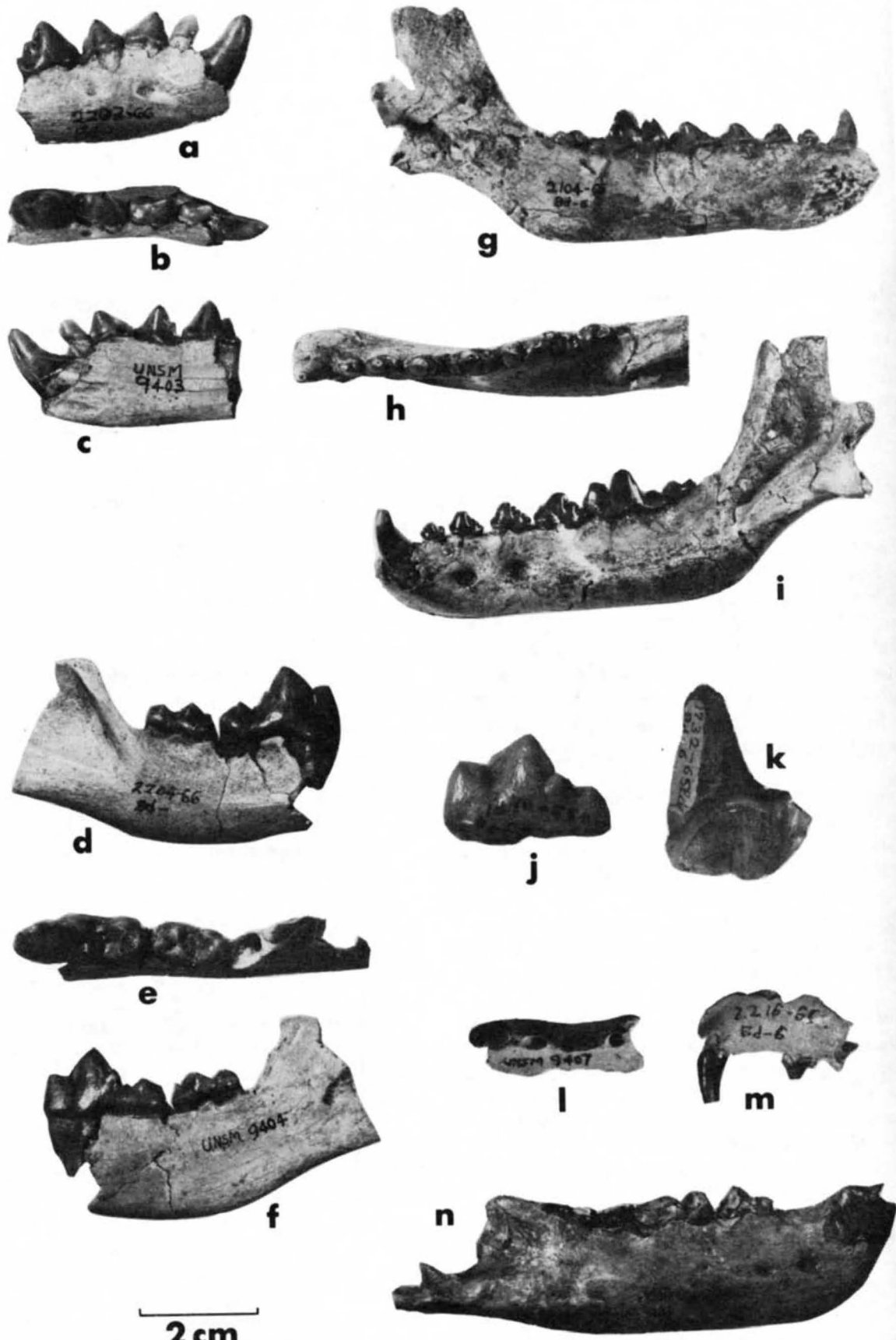


Table I:

Comparison of Measurements (in millimeters) of *Tomarctus* cf. *brevirostris*
 (U.N.S.M. 9403-9404) from the Jamber Quarry with A.M.N.H. 13836
 (After Matthew and Cook, 1909, Holotype of *Tephrocyon hippophagus*,
 Later Referred to *Tomarctus brevirostris*)
 and with F.S.G.S. V-5260 (After Olson, 1956, Holotype of *Tomarctus canavus*).
 (), Approximate or Alveolar
 A-P, Anteroposterior Length
 T, Transverse

	F.S.G.S. V-5260	A.M.N.H. 13836	U.N.S.M. 9403	U.N.S.M. 9404
A-P, /C			9.4	
T, /C			5.6	
A-P, P/1			4.7	
T, P/1			3.3	
A-P, P/2	7.0	8.5	7.7	
T, P/2	3.5	5.0	4.4	
A-P, P/3		9.4	9.0	
T, P/3		6.0	4.9	
A-P, P/4	10.0	12.0	10.5	
T, P/4	5.0	6.8	6.3	
A-P, M/1	16.0	19.7		21.0
T, M/1	7.0	9.0		8.4
A-P, M/2	9.0	10.3		12.2
T, M/2	6.0	7.2		6.8
A-P, M/3				(6.0)
T, M/3				(4.5)
Length, M/1-M/2				(33.1)
Length, M/2-M3				17.4
Length, premolars		33.0	29.3	
Length, molars		35.8		48.8
Depth jaw, below P/1*			13.9	
Depth jaw, below P/2*		21.3	15.1	
Depth jaw, below P/3*			13.8	
Depth jaw, anterior P/4			14.1	
Depth jaw, middle M/1				17.6
Depth jaw, middle M/2		25.0		19.2
Thickness, below P/2			9.0	
Thickness, below P/4			8.6	
Thickness, below M/1				11.0

*Internal measurement.

←

- Figure 1. a-c *Tomarctus* cf. *brevirostris*, U.N.S.M. 9403, partial right ramus (lingual, occlusal, and buccal views). X 1.
 d-f *Tomarctus* cf. *brevirostris*, U.N.S.M. 9404, partial right ramus (buccal, occlusal, and lingual views). X 1.
 g-i *Aelurodon haydeni*, U.N.S.M. 9401, left ramus (lingual, occlusal, and buccal views). X 1/2.
 j *Aelurodon haydeni*, U.N.S.M. 9402, partial right M/1 (lingual view). X 1.
 k *Aelurodon haydeni*, U.N.S.M. 9405, partial left P4/ (lingual view). X 1.
 l-m *Leptocyon* cf. *vafer*, U.N.S.M. 9407, partial left maxillary (occlusal and buccal views). X 1.
 n *Pseudaelurus* cf. *marshi*, U.N.S.M. 9408, partial right ramus (buccal view). X 1.

ramus, of a young adult with all molars fully erupted and showing little wear. The talonid of the M/1 shows the hypoconid-entoconid ridge that is typical of *Tomarctus* (Olsen, 1956:2).

Only *Tomarctus brevirostris* and *T. canavus* are noted as having "two subsidiary cusps anterior to the hypoconid and entoconid respectively" (Olsen, 1956:2). U.N.S.M. 9404 has only one well developed subsidiary cusp located anterior to the hypoconid.

Tephrocyon hippophagus (Matthew and Cook, 1909:373) has been synonymized with *Tomarctus brevirostris* (VanderHoof and Gregory, 1940:159). The type measurements of *Tephrocyon hippophagus* and *Tomarctus canavus* (= *Cynodesmus canavus*, according to Olsen, 1956) were used for comparison of the Jamber Quarry specimens. In size, the U.N.S.M. specimens correspond more closely with *Tomarctus brevirostris* than with *T. canavus*. The slightly smaller size of U.N.S.M. 9403 and 9404 as compared to the type specimen of *T. hippophagus* (Matthew and Cook, 1909:375) and the presence of only one subsidiary cusp instead of two is attributed to individual variation.

Measurements.—See Table I.

Aelurodon Leidy, 1858

Aelurodon haydeni (Leidy) 1858

Holotype.—Fragment of a lower jaw with P/3–M/1, and alveoli for the posterior molars. U.S.N.M. Type no. 124 from the Pliocene of northern Nebraska (Leidy, 1858; 1869, pl. 1, Fig. 10).

Referred Specimens.—Nearly complete left ramus of a young adult with the incisors and M/3 missing: U.N.S.M. 9401 (Fig. 1, g-i) (see Messenger and Messenger, 1976). Partial right M/1 lacking roots: U.N.S.M. 9402 (Fig. 1, j). Posterior half of a left P4/ with metacone and base of protocone: U.N.S.M. 9405 (Fig. 1, k).

Discussion.—In U.N.S.M. 9401 all premolars are stepped, increase gradually in size from P/1–P/4, and tilt slightly backward in the jaw. P/4 is relatively enlarged (see also McGrew, 1935:311), with the length of P/3 more than 70% of P/4 as in *A. haydeni*. M/1 of U.N.S.M. 9401 has a long talonid, large in relation to the length of the tooth, with the hypoconid and entoconid opposite and subequal. There is no evidence of any hypoconid-entoconid ridge or accessory cusps. A broad talonid and strong anterolabial cingulum are present on the M/2. The protoconid and metaconid are subequal, and with the smaller paraconid, form a trigonid. In this specimen the teeth are not crowded and are set straight in the jaw. The jaw is not massive or shortened as is typical of the *A. taxoides* group (see Gregory, 1942, Fig. 9, and VanderHoof and Gregory, 1940, for illustration and comparisons of the *A. taxoides* group).

Cook's type specimen of *Tephrocyon mortifer* (Cook, 1914) which has been referred to *Aelurodon haydeni* by VanderHoof and Gregory (1940:147), is somewhat larger than U.N.S.M. 9401, and has a double-rooted M/3. The M/3 on the Jamber Quarry specimen is missing, but appears to have had a single root. Other specific characteristics seem to correspond. U.N.S.M. 9401 is assigned to *Aelurodon haydeni* even though in some measurements it is up to one-third smaller than the type. In general the measurements of this specimen fall within the observed range of variation of the "*A. saevus* group" of McGrew (1944) which includes *Aelurodon haydeni* as its largest member.

U.N.S.M. 9402 is a partial right M/1 lacking roots. The tooth appears to be unworn and is slightly smaller than U.N.S.M. 9401, but possesses the same characteristics. The lack of wear might indicate that this tooth was unerupted at the time of the animal's demise.

U.N.S.M. 9405, the posterior half of a left P4/, is broken in such a way that the metacone and the base of the protocone are all that remain (Fig. 1, k). A strong lingual cingulum is present and the metacone is unworn. The posterior root of the tooth appears to extend from mid-way above the protocone almost to the posterior edge of the tooth.

Measurements.—See Table II.

Aelurodon sp.

Referred Specimen.—Partial left lower canine: U.N.S.M. 9406.

Discussion.—This tooth is a little smaller but compares favorably in form with the canine in U.N.S.M. 9401.

Leptocyon Matthew, 1918

Leptocyon cf. *vafer* (Leidy), 1858

Holotype.—Greater portion of a right ramus of a lower jaw, containing all the teeth except the incisors (Leidy, 1858: 21; 1869, pl. 1, Fig. 11).

Referred Specimen.—Left maxillary fragment with C/ (lacking tip) and P2/. The alveolus for P1/ and the anterior alveolus for P3/ are also present: U.N.S.M. 9407 (Fig. 1, l, m).

Discussion.—The canine is slender, oval shaped, and set at almost a right angle to the tooth row. P2/ has two roots, is slightly stepped on the anterior border and distinctly stepped on the posterior. A small cingulum is present and better developed lingually than buccally. The whole tooth is slender, delicate and little-worn. This specimen compares well with referred specimens in the U.N.S.M. Collections from the basal part of the type section of the Valentine Formation at

Table II

Comparison of Measurements (in millimeters) of *Aelurodon haydeni*
(U.N.S.M. 9401-9402) from the Jamber Quarry with U.S.N.M. 124
(After Matthew and Cook, 1909, Holotype of *Aelurodon haydeni*).

(), Alveolar

A-P, Anteroposterior Length

T, Transverse

	U.S.N.M. 124	U.N.S.M. 9401	U.N.S.M. 9402
A-P, /C			
T, /C		10.8	
A-P, P/1		9.7	
T, P/1		8.5	
T, P/1		6.0	
A-P, P/2		12.0	
T, P/2		7.4	
A-P, P/3		14.1	
T, P/3		8.3	
A-P, P/4	20.1	18.6	
T, P/4	10.0	9.8	
A-P, M/1	36.0	29.2	26.2
T, M/1	16.0	12.2	10.8
A-P, M/2	18.0	12.5	
T, M/2		8.2	
A-P, M/3		(5.5)	
T, M/3		(3.3)	
Length, /C-M/3		117.8	
Length, P/1-M/3		102.6	
Length, P/2-M/3		93.5	
Length, P/3-M/3	97.0	79.2	
Length, P/4-M/3		65.0	
Length, P/1-M/2		96.4	
Length, P/2-M/2		87.4	
Length, P/3-M/2		73.5	
Length, P/4-M/2		59.1	
Length, M/1-M/2		40.6	
Length, M/2-M/3		18.3	
Length, premolars		55.3	
Length, molars		47.3	
Depth jaw, posterior /C		27.8	
Depth jaw, posterior M/2		38.5	
Depth jaw, below P/1 *		29.0	
Depth jaw, below P/2 *		30.1	
Depth jaw, below P/3 *		30.1	
Depth jaw, anterior P/4 *		30.9	
Depth jaw, middle M/1 *	44.3	34.0	
Depth jaw, middle M/2 *		37.6	
Thickness, below P/2		15.7	
Thickness, below P/4		16.8	
Thickness, below M/1	20.0	16.5	

*Internal measurement.

the Railroad Quarry (U.N.S.M. Coll. Loc. Cr-12) near Valentine, Cherry County, Nebraska.

Measurements of the specimen are given below.

	C/	P1/ (alveolar measurement)	P2/	P3/ (anterior alveolus)
A-P	6.6	3.8	6.2	2.5
T	3.6	2.2	2.3	1.9

FAMILY FELIDAE

Pseudaehurus Gervais, 1848-1852

Pseudaehurus cf. *marshi* Thorpe, 1922

Holotype.—Both lower jaws, partially restored. Y.P.M. 12865 from the Upper Miocene (Valentine) Beds of the Niobrara River near the mouth of Minnechaduza Creek, Cherry County, Nebraska (Thorpe, 1922: 446-447, Fig. 12).

Referred Specimen.—Partial right ramus, with /C-M/1: U.N.S.M. 9408 (Fig. 1, n).

Discussion.—The teeth, with the exception of the P/3, are broken off at the jaw line. Only the lingual half of the P/3 and a piece of the anterior lingual quarter of the P/4

remain. Alveolar measurements of the teeth fall in the range between *P. marshi* and *P. intrepidus* as given by Thorpe (1922:447), but seem to correspond more closely to *P. marshi*, especially in the diastema measurement. This jaw is shorter than the type of *P. intrepidus*.

Measurements.—See Table III.

SUMMARY

The carnivore assemblage from the Jamber Quarry (Bd-6) appears to be composed of *Pseudaehurus*, one species of *Tomarctus* (2 specimens), at least one species of *Aelurodon* (4 specimens), and a *Leptocyon*. Most of the specimens represent young adults, with the exceptions being the possibly unerupted *Aelurodon* M/1, and the *Pseudaehurus* specimen. Although all of the teeth in the *Pseudaehurus* jaw were fully erupted, they are too badly broken to determine the age of the individual. The carnivores represented in this fauna and the sediments from which the fauna was recovered appear to be Lower Valentinian in age.

ACKNOWLEDGMENTS

The discovery of this important fossil quarry (Bd-6) was a direct result of the Visiting Scientist Program of the Nebraska Academy of Sciences in that Ronald Gustafson, County Extension Agent for Boyd County, requested that a speaker be sent to School District No. 1 in Boyd County, Nebraska. The Evan Lewis family had located some large

Table III:

Comparison of Measurements (in millimeters) of *Pseudaehurus* cf. *marshi*
From the Jamber Quarry with Y.P.M. 12865
(After Thorpe, 1922, Holotype of *Pseudaehurus marshi*)
and with the Holotype of *Pseudaehurus intrepidus*
(Also After Thorpe, 1922, Depository Not Given).
A-P, Anteroposterior Length

	Y.P.M. 12865	<i>Pseudaehurus</i> <i>intrepidus</i>	U.N.S.M. 9408
Length of tooth series (P/3-M/1)	36.0	44.5	40.1
Diastema between /C and P/3	8.6	14.8	8.9
A-P, P/3	9.5	11.6	11.2
A-P, P/4	12.5	14.8	13.3
A-P, M/1	16.0	19.6	16.9
Width of jaw at sectorial	9.0	-----	11.4
Depth of jaw at P/4	17.0	23.2	20.0

"elephant bones" on the Joseph Jamber farm and wished to have the specimens identified. Professor Lloyd Tanner made the Academy visit to the school in 1961 and identified the fossils. A field trip to the Joseph Jamber farm resulted in the discovery of this very important fossil locality.

We would like to thank our staunch supporters and colleagues in the Division of Vertebrate Paleontology at the University of Nebraska State Museum; namely, R. George Corner, King Richey, Dr. C.B. Schultz, Professor T.M. Stout, Professor Lloyd Tanner, and Dr. Michael Voorhies, for their counsel. Dr. Larry Martin, now of the University of Kansas, Tod Ashmun, David Nixon, Ron Marquart, and Joan Tomlinson helped us collect the specimens from the Jamber farm. Typing was done by Mrs. Rebecca Monke and Gail Littrell. We especially wish to thank Mr. and Mrs. Joseph Jamber for letting us excavate fossils on their land, and Ronald Gustafson, the Floyd McNares, and the Evan Lewis family for their aid during the period of excavation.

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